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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/847,967 04/22/97 GOLDWASSER

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EXAMINER

HM12/0801

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ART UNIT

PAPER NUMBER

1627

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

File copy

Office Action Summary

Application No.
08/847,967

Applicant(s)
Goldwasser et al

Examiner
Maurie E. Garcia, Ph. D.

Art Unit
1627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on May 17, 2001

2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 8, 10, 11, 15-24, 26, 30-35, 42, 43, 45-49, 51-56, 58-60, 64-72, and 74-95 is/are pending in the application

4a) Of the above, claim(s) 58, 59, and 79 is/are withdrawn from consideration

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 8, 10, 11, 15-24, 26, 30-35, 42, 43, 45-49, 51-56, 60, 64-72, 74-78, and 80-95 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

19) ☐ Notice of Informal Patent Application (PTO-152)

17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 26

20) ☐ Other: _____

DETAILED ACTION

Request for Continued Examination

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 17, 2001 has been entered.
2. The Response filed May 17, 2001 (Paper No. 25) is acknowledged. Claims 42, 68, 70, 72 and 74 were amended and claims 81-95 were added. Therefore, claims 8, 10, 11, 15-24, 26, 30-35, 42, 43, 45-49, 51-56, 58-60, 64-72 and 74-95 are pending.
3. Claims 58, 59 and 79 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to non-elected species. Note that applicants have elected the species where in the materials are applied by electron beam evaporation, the materials are to be screened for optical properties and the materials are to be *inorganic materials, specifically ceramics* (see supplemental election of species filed January 4, 2000 (Paper No. 15)).

4. Claims 8, 10, 11, 15-24, 26, 30-35, 42, 43, 45-49, 51-56, 60, 64-72, 74-78 and 80-95 are examined on the merits. Note that claims 74, 78 and 80 are being examined to the extent of the elected species (inorganic materials, specifically ceramics).

Withdrawn Rejections

5. All previous rejections under 35 USC 112 and 35 USC 102 have been withdrawn in view of applicant's arguments and amendments. Also, the provisional double patenting rejections over copending Applications No. 09/127,195 and 09/156,827 are withdrawn in view of applicant's arguments. The double patenting rejections over issued patents 5,985,356 and 6,004,617 are maintained, however (see below).

***Maintained Rejections
Double Patenting***

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

7. A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b). Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 8, 10, 11, 15-24, 26, 30-35, 42, 43, 45-49, 51-56, 60, 64-72, 74-78, 80 and newly added 81-95 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-67 of U.S. Patent No. 5,985,356. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application are directed to methods of making and methods of making/evaluating arrays of inorganic compounds (elected species) by adding a first and second component of a material to different regions of a substrate.

9. Claims 8, 10, 11, 15-24, 26, 30-35, 42, 43, 45-49, 51-56, 60, 64-72, 74-78, 80 and newly added 81-95 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3-49 and 56-61 of U.S. Patent No. 6,004,617. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application are directed to methods of making and methods of making/evaluating arrays of inorganic compounds (elected species) by adding a first and second component of a material to different regions of a substrate. It is also noted that the claims of the '617 patent recites making at

least two arrays. As the arrays of the instant application are neither limited to being constructed on a single monolithic support, nor are the two arrays of the '617 limited to being prepared on separate supports this limitation does not distinguish the inventions. Moreover, preparing two or more copies of an array by method of the instant claims would read on the two arrays of the '617 patent. One of ordinary skill in the art would reasonably have been motivated to prepare more than one copy of the array in order to use them in a series of destructive tests or to sell the arrays.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 92-95 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a new matter rejection.

The specification as originally filed does not provide support for the invention as now claimed. Newly added claims 92-95 recite specific temperatures, temperature ranges and thickness ranges. Applicant points to various places for support for these new claims; however, the pages cited do not *specifically* set forth the recited temperatures, temperature ranges and thickness

ranges. Thus, there does not appear to be support for the specific limitations now claimed. In accordance with MPEP § 714.02, applicants should *specifically point out support* for any amendments made to the disclosure.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 8, 10, 11, 15-24, 26, 30-35, 42, 43, 45-49, 51-56, 60, 64-72, 74-78 and 80-91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fister et al (on PTO-1449) in view of Cavicchi et al (US 5,365,756; of record).

Fister et al teach the preparation of superlattices, which are generally depicted in Figure 6. The reference discusses thin film reactions in general (beginning on page 161) and their advantages. Fister et al teach that the “ideal synthetic approach to a desired compound involves the reational choice of specific reaction conditions and steps designed to prepare the final compound as selectively as possible” and that the “key to applying this general philosophy to solid state synthesis is identifying and controlling a kinetic step in the reaction mechanism” (page 167, section 3.1). The reference goes on to teach that “superlattices presented several unique properties which could be exploited...” (page 169, bottom). The scope of the teachings of the reference is directed at preparing “initially layered composites in which the reactants interdiffuse to form a homogeneous, amorphous alloy” ...the “structure of the initial composite, the layering sequence and layer thicknesses is tailored to facilitate this pathway” (page 170, bottom). “The structure of the as-deposited films provides a well-defined synthetic starting point and parameters which can be correlated with subsequent reactivity” (page 171, top). The superlattices taught by Fister et al read on the claimed “inorganic materials” that are made by delivering “solid layers” onto a substrate. Fister et al teach that “the ability to deposit any sequence of layers and the independent control of layer thicknesses are crucial for both understanding and controlling interdiffusion reactions” and teach a system designed to provide such control (page 171 and Figures 7-9). The reference also describes various “complex layer sequences” such as ABC and ABCB (page 171, middle), with specific examples such as Figures 16 and 17 (ten layer

superlattices). These teachings read on the various layer structures set forth in independent claims 42, 68, 70, 72, 74, 84 and 88 (and dependant claims also).

The reference also teaches “rational design of superlattice reactants” (beginning on page 209), with specific examples thereof. Lastly, Fister et al teach applying this approach to the preparation of new compounds (page 227, 2nd paragraph).

The reference lacks the teaching of preparing an array of such superlattice compounds and certain specific limitations of the dependent claims regarding preparation and screening of such.

However, it was well known in the art at the time of filing to prepare arrays of inorganic materials and to screen them to look for materials with desired properties. For example, Cavicchi et al “provide a method of characterizing materials”, “investigating microsamples of materials” and “preparing a plurality of microsamples on a single substrate which have different characteristics” (see column 1, lines 58-68, for example). The methods of the reference are “particularly useful for materials development” (column, 13, line 27). The reference teaches (1) preparing a substrate for receiving materials through temperature and bias control, (2) deposition of materials to form a micro array, (3) processing (i.e., heating, cooling, etc.) the array in any atmosphere, (4) formation of alloys (i.e., mixing of components) on the substrate, and (5) measuring the resulting properties of the materials formed (see abstract, for example). The reference also teaches forming up to 1000 micro-samples in the arrays (column 3, lines 37-50) and that each sample is prepared on a separate microfabricated hot plate such that the components do not substantially interdiffuse between the

isolated microstructure regions (see Figure 5, for example). The reference teaches the microsubstrates can be used to prepare and test properties of materials (e.g., electrical properties as discussed in the abstract and preparing and evaluating superconductors, as discussed in column 13 lines 33-60). See also patented claims 15-16 in reference to "characterizing material properties". The reference teaches parallel delivery of reactants to the micro-hotplates and also post-fabrication treatments, see column 9, line 60 through column 10, line 46. The reference also teaches that masks can be used to direct the application of materials sequentially to desired regions (reading on physical masking). See the following from Cavicchi et al:

"Another deposition technique which can be used according to the present invention involves lithographically to define selected microsubstrates for deposition. For example, it is possible to coat an entire chip with a photoresist and thereafter expose selected micro-hotplates using a mask and appropriate illumination. Development proceeds by dissolving the exposed photoresist in a solvent in a known manner." (See column 10)

and

Claim 6. A method of preparing a plurality of micro-samples of materials for investigation according to claim 5, wherein said lithography process involves applying a resist material to said substrate, irradiating portions of said resist material utilizing a mask and removing said irradiated portions of said resist material the materials.

The reference teaches of gas phase reactants to alter the stoichiometry the materials (see abstract) and also teaches that the materials may be applied by electron beam evaporation (see column 10, lines 55-58). The reference teaches that superconductors and optical semiconductor materials such as GaAs can be grown on the microsubstrates and also teaches analysis using different techniques including optical techniques (column 11 lines 46-62, see also patented claim 15-16). Moreover, the reference teaches that $\text{YBa}_2\text{Cu}_3\text{O}_7$ superconductors, Si, GaAs and SnO_2 may be applied which read on ceramic materials and that:

"Pixels are also addressed to control properties during post-deposition processing steps such as heating in vacuum or various gases to alter stoichiometry of a single material, or to alloy multiple composition materials."

Cavicchi et al teach that “the ability to simultaneously process hundreds of microsamples with a range of temperature parameters would greatly enhance the optimization of the processes” and that the “ability to examine many micro samples in delicate micro-probing instruments ...would speed the development process” (column 14, lines 9-16).

Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art to make the superlattices taught by Fister et al using the methods of Cavicchi et al directed to “characterizing materials”, “investigating microsamples of materials” and “preparing a plurality of microsamples on a single substrate which have different characteristics”. One would have been motivated to do so based on the “unique properties” of superlattices taught by Fister et al, the use of such to the prepare new compounds and also the need to have a diversity of materials to screen for desired properties and the advantages of the methods of Cavicchi et al (“the ability to simultaneously process hundreds of microsamples with a range of temperature parameters would greatly enhance the optimization of the processes” and that the “ability to examine many micro samples in delicate micro-probing instruments ...would speed the development process” (column 14, lines 9-16)).

Status of Claims/Conclusion

15. No claims are allowed.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maurie E. Garcia, Ph.D. whose telephone number is (703) 308-0065. The examiner can normally be reached on Monday-Thursday from 9:30 to 7:00 and alternate Fridays.

17. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jyothsna Venkat, can be reached on (703) 308-2439. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-4242. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.


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Maurie E. Garcia, Ph.D.
July 27, 2001